

RESEARCH ARTICLE

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Mediating Factors in Early Diagnosis of Breast Cancer: from Initial Changes in Health to Breast Cancer Detection

Nasrin Fouladi^{1,2*}, Farhad Pourfarzi¹, Aida Daneshian¹, Sara Alimohammadi³

Abstract

Background: Breast cancer is one of the most frequently occurring cancers in women throughout the world. In Iran, according to available reports, 70% of patients with breast cancer are detected at the advanced stages of the disease. **Materials and Methods:** This study is of descriptive-analytic cross-sectional type. 160 female patients were selected. The data in this study was collected via face to face interview using a questionnaire based on the Anderson's delay model. Data were analyzed using SPSS 22 and the significance level was considered to be 0.05. **Results:** The results showed that presence of mass was the first symptom in many of women, i.e., 76 cases (47.5%). not only the presence of mass in the breast, but also any other symptom, hadn't been taken as a serious problem initially by women. Non-improvement of the symptoms and exacerbation of the symptoms was considered as a symptom of illness by patients. After considering the changes as the symptoms of illness, patients had tried to treat the disease through different methods of self-treatment. The failure of the self-treatment in controlling the symptoms, had directed the patients toward seeking for medical services. Out of 160 patients, 49 patients (39.6%) changed the time of their appointment with doctor. 110 cases (68%) out of 160 patients, rather than initiating relevant diagnostic procedure related to the disease, had received non-specific and non-related therapeutic measures. **Conclusion:** Pondering on the results yields that patient-related delays, resulting from their lack of awareness of the disease, cultural factors, and fear, can only play an important role in postponement of visiting a physician, but in the diagnosis of disease it is the inability of general practitioners in performing differential diagnoses, and making request for related diagnostic measures which can significantly increase the lag time until the onset of the main treatment.

Keywords: Breast cancer- delay- Anderson model

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Introduction

Introduction: Breast cancer is one of the most frequently occurring cancers and the leading cause of death from cancer in women throughout the world (Ferlay et al., 2015). Patients with breast cancer in Iran are younger and in many cases, due to lack of awareness visit the physicians or specialists in more advanced stages and die in a short time after diagnosis (Fouladi et al., 2011; Fouladi et al., 2012; Harirchi et al., 2000). In Iran, according to available reports, 70% of patients with breast cancer are detected at the advanced stages of the disease (Harirchi et al., 2000).

Delay in the diagnosis and treatment of breast cancer can result in diagnosis of the disease at a more advanced stage of the disease, an increase in mortality rate, and a decrease in the chance of survival (Fouladi et al., 2011; Rastad et al., 2012). If early detection is accompanied by a more conservative surgical treatment (Montazeri et al., 2003), it can raise the survival rate in patients (Allgar and

Ne al., 2005; Dobson et al., 2014).

A wide range of factors, directly or indirectly, have role as to when the patients visit doctors and receive diagnostic and therapeutic measures (Walter et al., 2012). Taking the considerable cost of treating the disease, recognizing these factors is highly valued for policy makers in the health system (Bairati et al., 2006).

Various studies have studied the amount of delay in diagnosing the disease and the factors increasing the interval between the occurrence of symptoms and the diagnosis of the disease (Allgar and Neal, 2005; Ashing-Giwa et al., 2010; Nosarti et al., 2000; Salih et al., 2016). However, the number of studies that have investigated the causes of delay based on the structures of a model is scanty. Identification of causes, on the basis of the structures of a model, can lead to more successful designing of educational and operational interventions tailored to the conditions of the target community. This study relying on Anderson's (1995) Five Stage Model, which includes four stages related to patient and one

¹Community Medicine, Faculty of Medicine, ²Social Determinants of Health Research Center of Ardabil University of Medical Sciences, Ardabil, ³Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran. *For Correspondence: n.fouladi@arums.ac.ir

stage concerning health care providers, examines delay in five stages of appraisal, illness, behavior, scheduling and partially treatment stage. It allows for the in-depth examination of mediating factors from appearing of the symptoms until the early diagnosis of breast cancer (Andersen and Cacioppo, 1995; Walter et al., 2012).

Materials and Methods

Study design and setting

A descriptive-analytic cross-sectional study was carried out on patients who were admitted to several centers including surgical, oncology in university hospitals or attending to private clinics in Ardebil, Iran.

Sampling size calculation

Taking significance level α at 95% the sample size was calculated by using formula $N = (z \alpha/2)^2 \times s^2/d^2$, where N = sample size $d = 1$ week $S=6.5$ week $z=1.96$. The sample size was fixed at 160 patients.

Sampling procedure

Convenient sampling was carried out and the sample had high variance in terms of economic and social class and age range.

The participants who had undergone surgery, or receiving supplementary treatment or had just completed their treatment were recruited.

Data collection procedure

Data were collected using a structured questionnaire via face to face interview based on the Andersen's model of total patient delay.

Measurement

The questionnaire was assembled with consideration for previous research results from a review of the literature. The questionnaire had questions regard to appraisal delay, patients were asked to select the physical complaints they had suffered from in the pre-diagnostic period. The questionnaire also included questions about the interpretation of the symptoms, and patients' explanations for these complaints. Regarding illness delay, patients were asked to select particular reasons they had to seek any type help for their complaints (such as different methods of self-treatment and causes of seeking for medical services), and whether the decision had been influenced by important others in their immediate environment. Behavioral delay contained questions regarding the reasons for postponing consulting a physician. The scheduling delay included questions about the first medical consultation and questions about onset of the physician's request for related diagnostic procedures in patients.

The other variables included in data analysis were: age, occupation, education level, income and marital status and family history of breast cancer.

The validity of the questionnaire, used in this study, was obtained through experts' comments on the questionnaire items, and its reliability, using alpha Cronbach, was estimated to be 81%.

Statistical analysis

The results were analyzed using SPSS, version 22, using chi-squared, and ANOVA to examine the relationships. Statistical significance was set at the 5% level.

Results also were summarized using descriptive summary measures for continuous variables, frequency and percent for categorical variables.

Ethical considerations

The research project was approved by the Research Ethics Committee (protocol No.IR.ARUMS.REC.2015.52).

Permission for conducting the study was obtained from each departments. After obtaining oral consent from each patient, Information sheet that contains about the benefit and risk of participating of the respondents in this study was attached to each questionnaire to brief each study participant.

Results

The mean age of the patients was 44.25 ± 1.33 and their age range was between 18 and 71 years. 38.8% of the patients had secondary education. 95 patients (59.37%) were married and 4 (2.5%) were divorced. 91 patients (56.9%) had a family history of breast cancer.

The number of the patients who were housewives was 85 (53%) and of those who were employed was 75 (47%) (Table 1).

Appraisal delay mediators

The early detected symptoms included lump in the breast of 76 patients (47.5%), pain in 39 patients (24.4%), skin changes in 27 patients (16.9%), and discharge from the nipple in 18 patients (11.2%) (Table 1).

The results showed that the majority of patients i.e., 80 patients (50%), had attributed the probable cause of the observed symptoms to changes in menstruation due to imminence of menopausal age, 48 patients (30%) had ascribed it to the use of hormonal or non-hormonal drugs, and 13 women (8.1%) had interpreted these changes resorting to common cultural beliefs in society about the causes of breast changes, and 12 cases (7.5%) had perceived it as a result of hit to breast, and 7 patients (4.4%) had associated the changes with breastfeeding. Totally, none of the patients had considered the observed symptoms as the symptoms of breast cancer.

The statistical test did not reveal any significant correlation between the type of patients' interpretation of the cause of the observed symptoms, and the level of education or family history of breast cancer in patients ($p=0.55$) ($p=0.89$).

Illness delay mediators

Non-improvement of the symptoms in 55 patients (34.4%), exacerbation of the symptoms in 56 cases (35%), family and friends' advice in 47 patients (29.4%), and becoming aware of the disease via mass media in 2 patients (1.2%) had propelled the patients to consider observed symptoms as a symptom of illness.

Table 1. Characteristics of Patients with Breast Cancer

Mean age (year)	44.25±1.33	range 18-71
Mean time from symptoms' onset till visiting a physician (day)	53±5.1	Range :7-360
Present symptom(s)	breast lump	76 (47.5%)
	Pain in breast	39 (24.4%)
	Skin changes in breast	27 (16.9%)
	Breast discharge	18 (11.2%)
Education	Illiterate	41 (25.6%)
	<high school	99 (62.1%)
	>high school	20 (12.5%)
Marital status	Single	34 (21.25%)
	Married	95 (59.37%)
	Divorced	4 (2.5%)
	Withdrawn	27 (16.87%)
Family history of breast cancer	Yes	91 (56.9%)
	No	69 (43.1%)
Occupation	Unemployed	85 (53%)
	Employed	75 (47%)

Behavioral delay mediators

After considering the changes as the symptoms of illness, patients had tried to treat the disease through different methods of self-treatment, without visiting a doctor. In this phase, 69 patients (43.1%) had resorted to herbal therapy, 66 people (41.2%) to self-prescribed synthetic drugs, and 25 patients (15.6%) to behaviors that can relieve the disease taken from cultural beliefs.

None of the types of self-treatment behaviors mentioned above were related to the level of education and family history of breast cancer and monthly income ($P = 0.29$) ($P = 0.84$). However, patients with higher levels of education had consumed more self-prescribed drugs and herbal medicines than those with lower levels of education. High-income individuals also had higher

self-treatment than those with lower income (Table 2).

The failure of the self-treatment in controlling the symptoms, had directed the patients toward seeking for medical services, but 72 patients (45%) due to fear of the disease, 47 patients (29.4%) on the recommendation of family and friends, 19 patients (11.9%) because of their families' low level of income, 19 patients (11.9%) due to lack of access to the doctor, and 3 patients (1.9%) for other reasons, hadn't been able to make an appointment with a physician or had postponed it. According to the patients' reports, the interval between their making decision to seek for medical advice, and their visiting a physician was several days in 39 cases (24.4%), some weeks in 59 cases (36.9%), and some months in 62 patients (38.7%).

Scheduling delay mediators

Out of 160 patients, 49 patients (39.6%) changed the time of their appointment with doctor. Of these 49 changes in the appointment time, 19 cases (38%) were due to travel, 12 cases (24%) were resulting from fear of illness, and 10 cases (16%) were as a consequence of family problems.

The statistical test did not show any significant difference between the change in the patient's visit time and their level of education, occupational status and family history of breast cancer in patients (0.15) (0.36) (0.46).

In this study, the mediating factors in early diagnosis were studied only until the onset of the physician's request for related diagnostic procedures in patients.

73 patients (45.6%) had visited two other physicians prior to the initiation of relevant diagnostic procedures, 62 patients (38.8%) had visited more than 3 doctors, and 25 patients (15.6%) had visited only one physician.

110 cases (68%) out of 160 patients, rather than initiating relevant diagnostic procedure related to the disease, had received non-specific and non-related therapeutic measures, including hormone therapy in 60 patients (54.5%), and antibiotic administration in 50 patients (35.5%), when the relevant diagnostic procedures started.

Table 2. The Relationship between the Patients' Behaviors at Each Stage with Their Demographic Characteristics

	Education level				Vocational status		Family history of breast cancer	
	illiterate	primary	secondary	academic	employed	housewife	Yes	No
The mean time from onset of symptoms to visiting a physician	56.41±51	56.24±46	55.2±55	40.11±34.15	35.3±32	68.08±58.6	54.01±46	51.97±56
p-value	P=0.36				P=0.00		P=0.8	
change the time of appointment with doctor								
Yes	11 (6.9%)	7 (4.4%)	22 (13.8%)	9 (5.6%)	25 (15.6%)	24 (15%)	30 (18.8%)	19 (11.9%)
No	30 (18.8%)	30 (18.8%)	40 (25%)	11 (6.9%)	48 (30%)	63 (39.4%)	61 (38.1%)	50 (31.3%)
p-value	P=0.15				P=0.36		P=0.46	
different methods of self-treatment								
self-prescribed synthetic drugs	18 (11.2%)	15 (9.4%)	27 (16.9%)	6 (3.8%)	36 (22.5%)	30 (18.8%)	36 (22.5%)	30 (18.8%)
herbal therapy	14 (8.8%)	15 (9.4%)	26 (16.3%)	14 (8.8%)	28 (17.5%)	41 (25.6%)	41 (25.6%)	28 (17.5%)
behaviors taken from cultural beliefs	8 (5%)	4 (4.4%)	6 (5.6%)	0 (0%)	9 (5.6%)	16 (10%)	14 (8.8%)	11 (6.9%)
p-value	P=0.15				P=0.15		P=0.84	

The amount of patient's delay and factors affecting it

The average amount of delay from onset of symptoms to visiting a physician in patients was 53 ± 5.1 days (Table 1).

From the onset of symptoms, 124 patients (77.5%) had postponed visiting a physician for about 3 months or less, and 36 patients (22.5%) had put it off more than three months.

The comparison of amount of delay from the onset of the symptoms to visiting a physician in patients with different level of education and family history didn't show any significant difference ($P = 0.36$).

But the comparison of this interval according to the occupation of patients between the two employed and non-employed groups showed a significant difference between the two groups ($P = 0.00$). And the employed patients had visited a physician in a significantly shorter while (Table 2).

Discussion

Considering the relatively high rates of breast cancer and the delay in the various stages of the diagnosis and treatment of disease in various studies, the present study examined the mediating factors influencing early diagnosis of the disease in patients based on the five steps of Anderson's model.

The mean time from the onset of symptoms to visiting a physician was 53 days, with a range of 7-360 days, which indicates delay on the part of the patients for receiving medical care. Various studies, such as Ozmen et al., (2015) and Salih et al., (2016) had shown the patients' delay for visiting a physician.

Investigating mediating factors related to appraisal stage of the Anderson model showed that the most commonly diagnosed symptom was presence of mass in breast, which was consistent with nosarti et al., (2000); Khabbazan et al., (2014) and Jasem et al., (2014) studies' findings. The results showed that presence of mass was the first symptom in many of women, i.e., 76 cases (47.5%). Although the presence of the mass can be a symptom of a disease, this sign didn't lead the patients to visit a doctor and receive medical care.

In this study, not only the presence of mass in the breast, but also any other symptom, hadn't been taken as a serious problem initially by women. This finding was in line with the results of the Rastad et al., (2012) study.

The results showed that it is only continuation or exacerbation of the symptoms that makes the women regard the problem as a significant one or a probable disease. However, the acceptance of the disease also does not entail patients' making decisions about visiting a physician. Instead for solving their problems, they carry out actions like self-treatment, herbal remedies or other methods that increase the time lag between onset of symptoms and visiting a physician or specialist.

It seems that the weakness of information providing programs and health education programs at the community level or the lack of proper organization of these programs can be a reason that causes patients, when they observe any deviation from normal conditions in their body

structure or function, not to see these signs as symptoms of the disease, and not seek for medical care. The results also showed that only 1.2% of patients, based on information from the mass media, had considered their symptoms as symptoms of illness, while most patients had taken them serious only if they were exacerbated or persistent. Even when they accepted their illness, they would prefer to take self-treatment instead of making decision to visit a doctor.

The rate of self-treatment in women with higher education was more than other women. This suggests that the level of health literacy in patients is not related to the level of education in the society. Therefore, designing and implementing appropriate health education programs in the community can increase the level of community awareness about health issues and cause women to be aware of and be sensitive to symptoms, and show proper behavior in case of arising problem.

Cultural beliefs in the community is another factor that also plays an important role in patients' interpretation and understanding of breast disorders causes, as well as their therapeutic behaviors, and makes individuals, in case of any disorder, act in accordance with their traditional beliefs. Consequently, they only decide to visit physicians, when they can't resolve their problems by adopting traditional methods.

Love et al., (2004) and Ruddy et al., (2014) have reported that the women who experience longer delay have tumors with advanced stage in their body. Therefore, the medical community must identify the impact of cultural dimensions on individuals' perception of the symptoms and their behaviors when the disease occurs, and, make attempt to reduce the impact of these factors as far as possible, on care behaviors of the people in the society.

Fear as an effective psychological mediators in delay, reported by 72 patients (45%), was the most preventive factor even after timely volition to visit a physician and receive medical care. This conclusion is consistent with the results of Bairati et al., (2006). The results of this study, contrary to Unger-Saldana and Infante-Castaneda (2011) study that found having a family history of cancer affects patient's decision-making behaviors, didn't detect any relationship between that the type of patient behaviors after the occurrence of symptoms and having history of cancer in their family. Regarding taboo on the word cancer in the society under study, the fear of being labelled as a person with cancer, may justify the contrast of the present study's results from others (Zamanzadeh et al., 2013). Other studies have also indicated that women with a history of cancer in their family experience more fear when symptoms appear (Lam et al., 2009; O'Mahony et al., 2011).

The adjacency of the two words of cancer and death in the minds of the people of the community makes people avoid going to the doctor due to fear of being labelled as a person with cancer. Given that fear acts as a deterrent in patients early visiting a physician or specialist, thus it seems necessary appropriate educational program to be developed for the women.

The results showed that a large number of patients had not undergone appropriate diagnostic procedures after

visiting a doctor and had received treatments by physicians which were irrelevant to their illness.

The study of Ermiah et al., (2012) which was conducted on 200 women with breast cancer, showed that delayed diagnosis by the doctor was due to the absence of clear symptoms in patients, while most patients had clear symptoms in the current study. The study of Salih et al., (2016) has also showed that delayed diagnostic procedures can be consequent of non-referral of patients for diagnostic procedures by physicians and provision of unrelated therapies to the patients. Therefore, the physicians' ability in making differential diagnoses and requesting for timely diagnostic tests can reduce the delay in diagnosis.

Pondering on the results yields that patient-related delays, resulting from their lack of awareness of the disease, cultural factors, and fear, can only play an important role in postponement of visiting a physician, but in the diagnosis of disease it is the inability of general practitioners in performing differential diagnoses, and making request for related diagnostic measures which can significantly increase the lag time until the onset of the main treatment. Therefore, designing and implementing specific health education programs in the community and the empowerment of general practitioners can reduce the delay in early diagnosis of the disease.

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